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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/875,501	06/04/2001	Klaus Florian Schuegraf	MI22-1741	6564

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WELLS ST. JOHN ROBERTS GREGORY & MATKIN P.S.  
601 W. FIRST AVENUE  
SUITE 1300  
SPOKANE, WA 99201-3828

EXAMINER

ORTIZ, EDGARDO

ART UNIT PAPER NUMBER

2815

DATE MAILED: 03/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.  
09/875,501

Applicant(s)  
Schuegraf Et.al.

Examiner  
Edgardo Ortiz

Art Unit  
2815



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on Dec 27, 2002
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 36 and 42-44 is/are pending in the application.
- 4a) Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 36 and 42-44 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claims \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some\* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\*See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 18 6) ☐ Other:

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### **DETAILED ACTION**

This Office Action is in response to an amendment filed December 27, 2002 on which Applicant amended claim 36, canceled claims 37-41 and added new claims 42-44.

#### ***Information Disclosure Statement***

1. The information disclosure statement filed December 27, 2002 fails to comply with 37 CFR 1.98(a)(1), which requires a list of all patents, publications, or other information submitted for consideration by the Office. It has been placed in the application file, but the information referred to therein has not been considered.

#### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 36 and 42-44 are rejected under 35 U.S.C. § 103 (a) as being unpatentable over Yang et.al. (U.S. Patent No. 6,040,238) in view of Ilg et.al. (U.S. Patent No. 6,130,145). With regard to Claim 36, a polysilicon layer (16) supported by a substrate (10), a metal silicide layer (18) supported by the polysilicon layer and a silicon-dioxide-containing dopant barrier layer (32)

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elevationally over the metal-silicide layer and substrate and the barrier layer against only the metal-silicide layer with respect to portions of the substrate laterally outward of the metal-silicide layer, see figure 6.

However, Yang fails to teach that the metal-silicide layer is doped and comprising a Group III dopant or a Group V dopant provided to a concentration of at least about  $1 \times 10^{18}$  ions/cubic cm. Ilg discloses an insitu doped metal polycide which includes a polysilicon layer (230) and a metal-silicide layer (240) against the layer of polysilicon, wherein the metal-silicide layer comprises a Group III dopant (B) or a Group V dopant (P, As) and has a concentration of dopants of at least  $1 \times 10^{18}$  ions/cubic centimeter, see column 4, lines 30-46. Therefore, it would have been an obvious modification to someone with ordinary skill in the art, at the time of the invention, to modify the structure as taught by Yang to include a metal-silicide layer with a concentration of dopants of at least  $1 \times 10^{18}$  ions/ cubic cm in a gate structure, as clearly suggested by Ilg, in order to lower the resistance of the metal-silicide layer.

With regard to Claim 42, a further difference between the claimed invention and Ynag is, the metal-silicide layer comprising tantalum. Ilg discloses an insitu doped metal polycide which includes a polysilicon layer (230) and a metal-silicide layer (240) against the layer of polysilicon, wherein the metal-silicide layer comprises tantalum, see column 4, lines 32-36. Therefore, it would have been an obvious modification to someone with ordinary skill in the art, at the time of

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the invention, to modify the structure as taught by Yang to include a metal-silicide layer comprising tantalum, as clearly suggested by Ilg, in order to improve the conductivity of the gate electrode stack of the semiconductor transistor.

With regard to Claim 43, Yang teaches a source/drain region (40) formed in the substrate (10) substantially laterally outward of the conductive line.

With regard to Claim 44, Yang teaches a field oxide region (12) formed in the substrate (10) laterally spaced from the conductive line, wherein the source/drain regions are formed within a portion of the substrate comprising substantially an entirety of the space between the field oxide region and the conductive line.

### ***Response to Arguments***

3. Applicant's arguments with respect to claims 36 and 42-44 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

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MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Edgardo Ortiz (Art Unit 2815), whose telephone number is (703) 308-6183 or by fax at (703) 308-7724. In case the Examiner can not be reached by a direct telephone call, you might call Supervisor Eddie Lee at (703) 308-1690. Any inquiry of a general nature or relating to the status of this application should be directed to the Group 2800 receptionist whose telephone number is (703) 308-0956.

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3/17/03



**EDDIE LEE**  
**SUPERVISORY PATENT EXAMINER**  
**TECHNOLOGY CENTER 2800**